the inverse distribution of elements as described in the specification. Additionally, claims 10, 11 and 22 were amended to correct previous clerical errors. No new matter has been added.

In response to the telephone interviews between Examiner Douglas Willie and Applicants' representatives on March 28, 2000 and May 3, 2000, Applicants submit herewith revised experimental data to provide further clarification of the nickel (Ni) and gold (Au) inversion process of the present invention. The revised experimental data contain labeling additions along the x-axis which clarify the previously submitted graphs and correct clerical labeling errors of the element curves. In addition, Applicants have used a black and white legend to identify the elements of the graphs instead of the previously submitted color graphs, which were less clear.

The revised experimental data filed herewith supercedes the annotated, color data graphs that were submitted with the April 14, 2000 Supplemental Amendment. Additionally, at Examiner Douglas' request made during the telephone interview on May 3, 2000, Applicants have attached hereto a Declaration which avers that the experimental data set forth in the revised graphs are identical to the data previously submitted.

In the experimental data submitted herewith, the inverse distribution of Ni and Au are examined under three conditions: a heating process with oxygen, illustrated by Figs. A-1, A-2L and A-2S; a process with no heat treatment, illustrated in Fig. A-3; and a process in a non-oxidative environment, illustrated by Figs. A-4 and A-5. The heat treatments for Figs. A-1, A-2L, A-2S, A-4 and A-5 were conducted at a temperature of 570°C for 3 minutes. Also, the medium position values of Ni and Au were used to determine whether an inversion takes place. The medium position is a statistical value of density concentration and divides the area of the graphs of Ni and Au in half.

The samples of Figures A-1, A-2L and A-2S illustrate the depth profile of the elements during the application of heat in an oxidative environment. In these figures, the

intensities of the Ni and Au samples undergo inversion when heated in the presence of oxygen. On the other hand, the samples of Figures A-4 and A-5 illustrate that the intensity profiles of Ni and Au samples do not undergo inversion when the heating process is conducted in a non-oxidative environment.

To assist the Examiner in analyzing the submitted data, Applicants respectfully direct the Examiner's attention to Figure A-3, which illustrates the depth profile of control samples that are neither heated nor subjected to heat treatment in an oxidative environment.

In Fig. A-3, with no heat treatment, the medium position of Ni is about 42 nm and the medium position of Au is about 15 nm. Thus, the density distribution of Ni is located at a deeper position than that of Au.

For example, in Fig. A-1, the medium position of Ni is about 30 nm, and the medium position of Au is about 70 nm. Thus, Au is located at a deeper position than that of Ni after application of heat in an oxidated atmosphere. Figs. A-2L and A-2S demonstrate similar results as Fig. A-1. The medium position of Au for A-2L and A-2S are approximately 75 nm and 90 nm respectively. Thus, the intensities of Ni and Au for samples subject to a heating process in an oxidative environment are inverted compared to the control sample of Fig. A-3.

Figs. A-4 and A-5 demonstrate an environment in which heat is applied in a non-oxidative or inert atmosphere. The medium position of Ni is 45 nm in Fig. A-4 and 60 nm in Fig. A-5. The medium position of Au is about 22 nm in Fig. A-4, and 24 nm in Fig. A-5. From the medium positions in Figs. A-4 and A-5, it is determined that there is no inversion of Ni and Au when heat is applied in a non-oxidative atmosphere.

The submitted data of Figs. A-1, A-2L, A-3, A-4 and A-5, filed herewith, help to distinguish Applicants' invention over U.S. Patent No. 5,563,422 issued to Nakamura et al. In particular, Nakamura et al. discloses that "it is preferred that the annealing treatment in the present invention be conducted under a non-oxidative or inert atmosphere, such as nitrogen"

(col. 6, lines 5-7, emphasis added). As shown in Figs. A-4 and A-5, inversion of Ni and Au does not occur under conditions such as specified in Nakamura et al. In the present invention, the inversion distribution of Ni and Au is conducted in an oxidative atmosphere with heat.

In summary, Nakamura et al. fail to teach the inversion of the two elements in an oxidative atmosphere. Therefore, the present invention is patentably distinct from Nakamura.

Applicants respectfully submit that the application is now in condition for allowance, and a Notice to that effect is earnestly solicited.

Respectfully submitted,

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Fig A-1

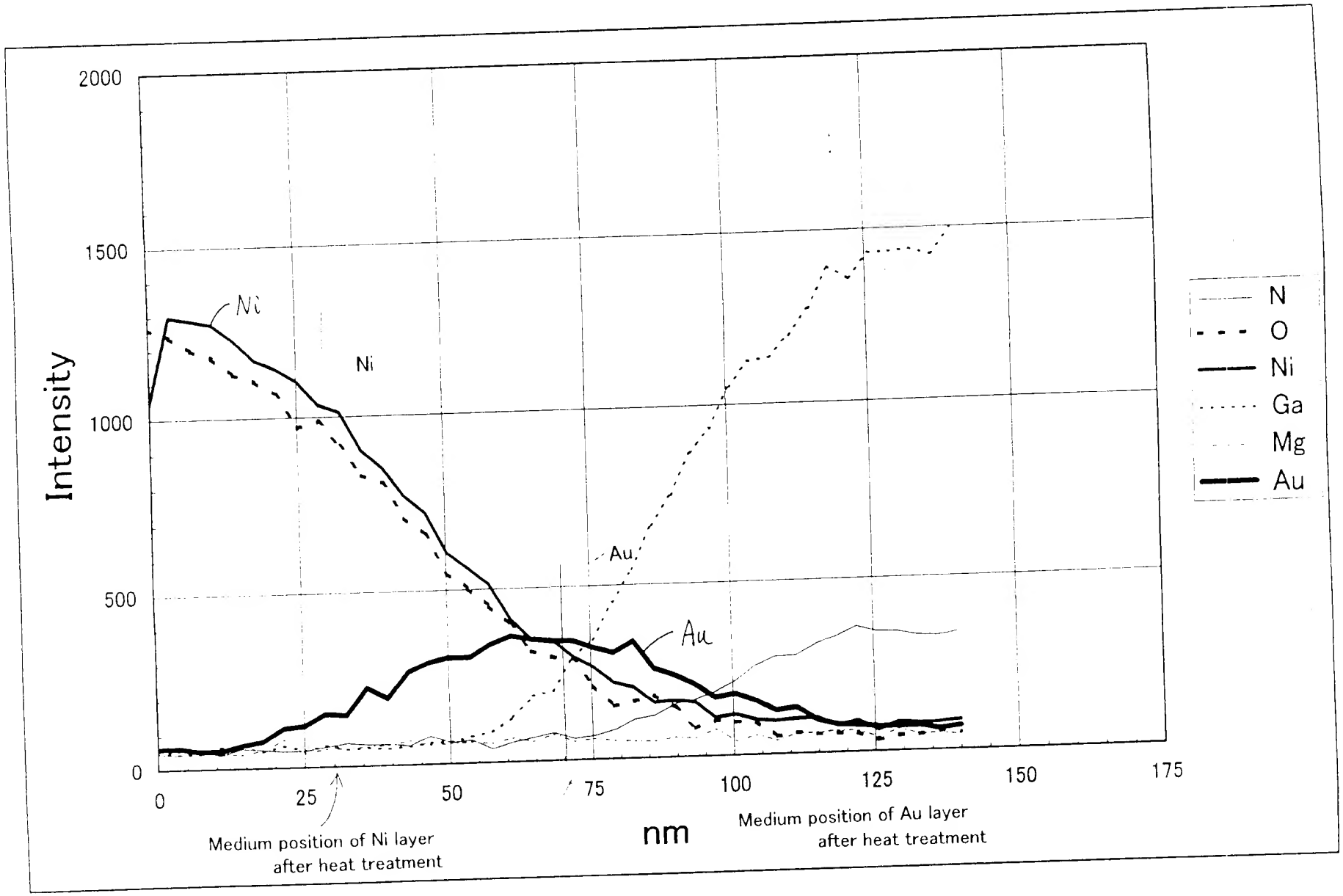

2000
1500
1000
500
0
Intensity
Ni
Ni
Au
Au
0
25
50
75
100
125
150
175
nm
Medium position of Ni layer
after heat treatment
Medium position of Au layer
after heat treatment
N
O
Ni
Ga
Mg
Au

Fig A-2L

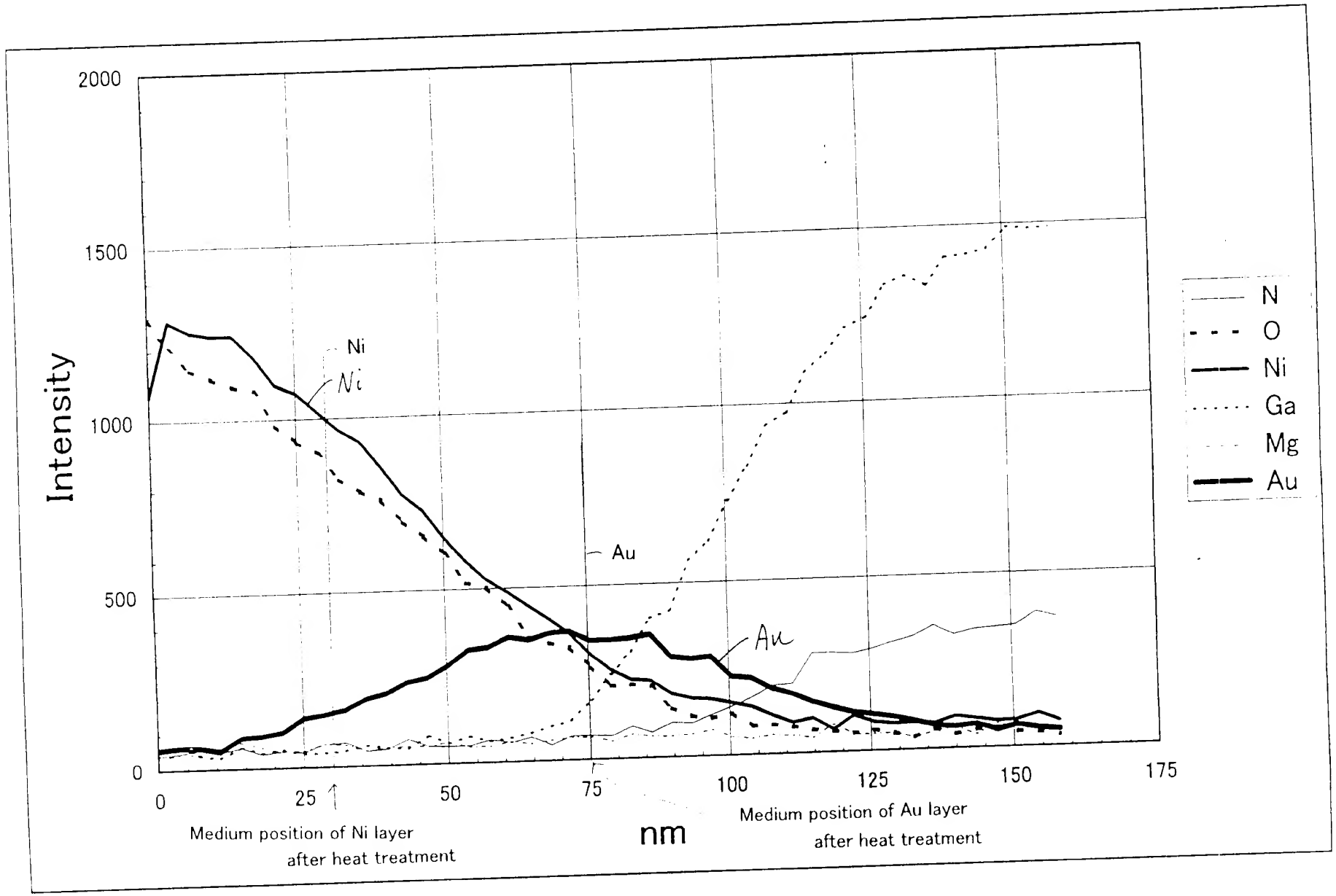

2000
1500
1000
500
0
Intensity
Ni
Ni
Au
Au
0
25
50
75
100
125
150
175
nm
Medium position of Ni layer
after heat treatment
Medium position of Au layer
after heat treatment
N
O
Ni
Ga
Mg
Au

Fig A-25

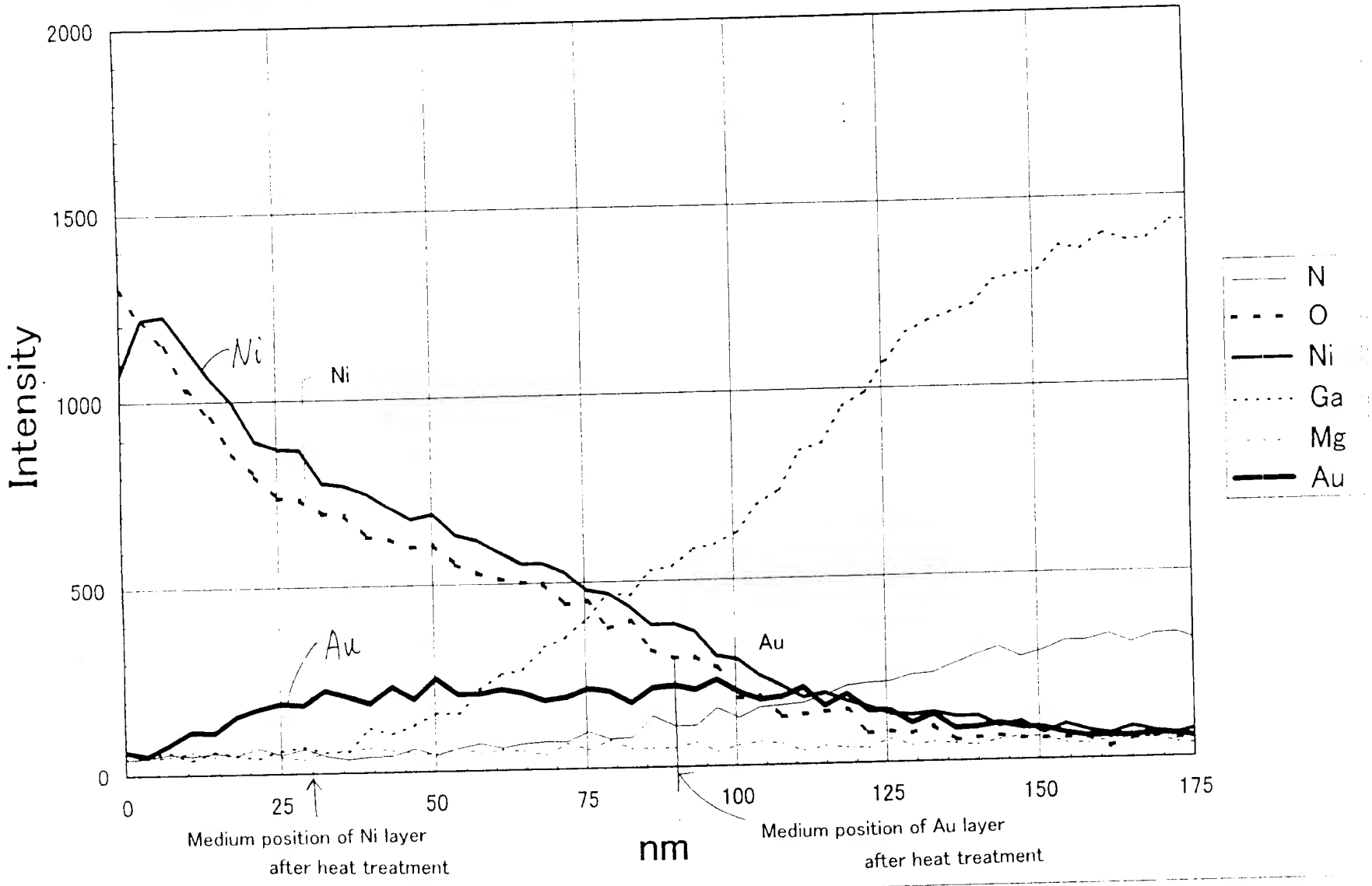

2000
1500
1000
500
0
Intensity
Ni
Ni
Au
Au
0
25
50
75
100
125
150
175
nm
Medium position of Ni layer
after heat treatment
Medium position of Au layer
after heat treatment
N
O
Ni
Ga
Mg
Au

Fig A-3

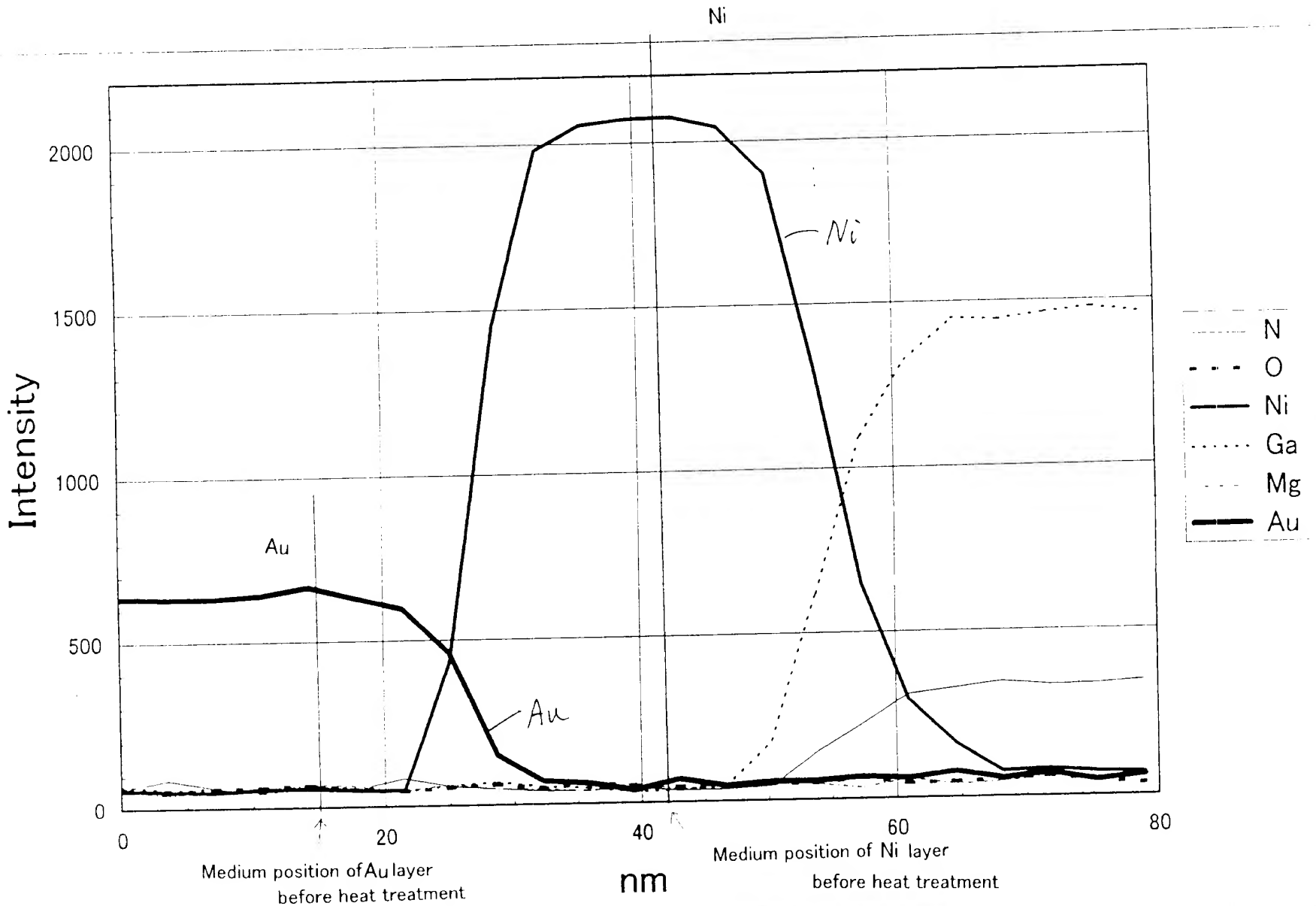

Ni
2000
1500
1000
500
0
Intensity
Au
Ni
Au
N
O
Ni
Ga
Mg
Au
0
20
40
60
80
nm
Medium position of Au layer
before heat treatment
Medium position of Ni layer
before heat treatment

Fig A-4

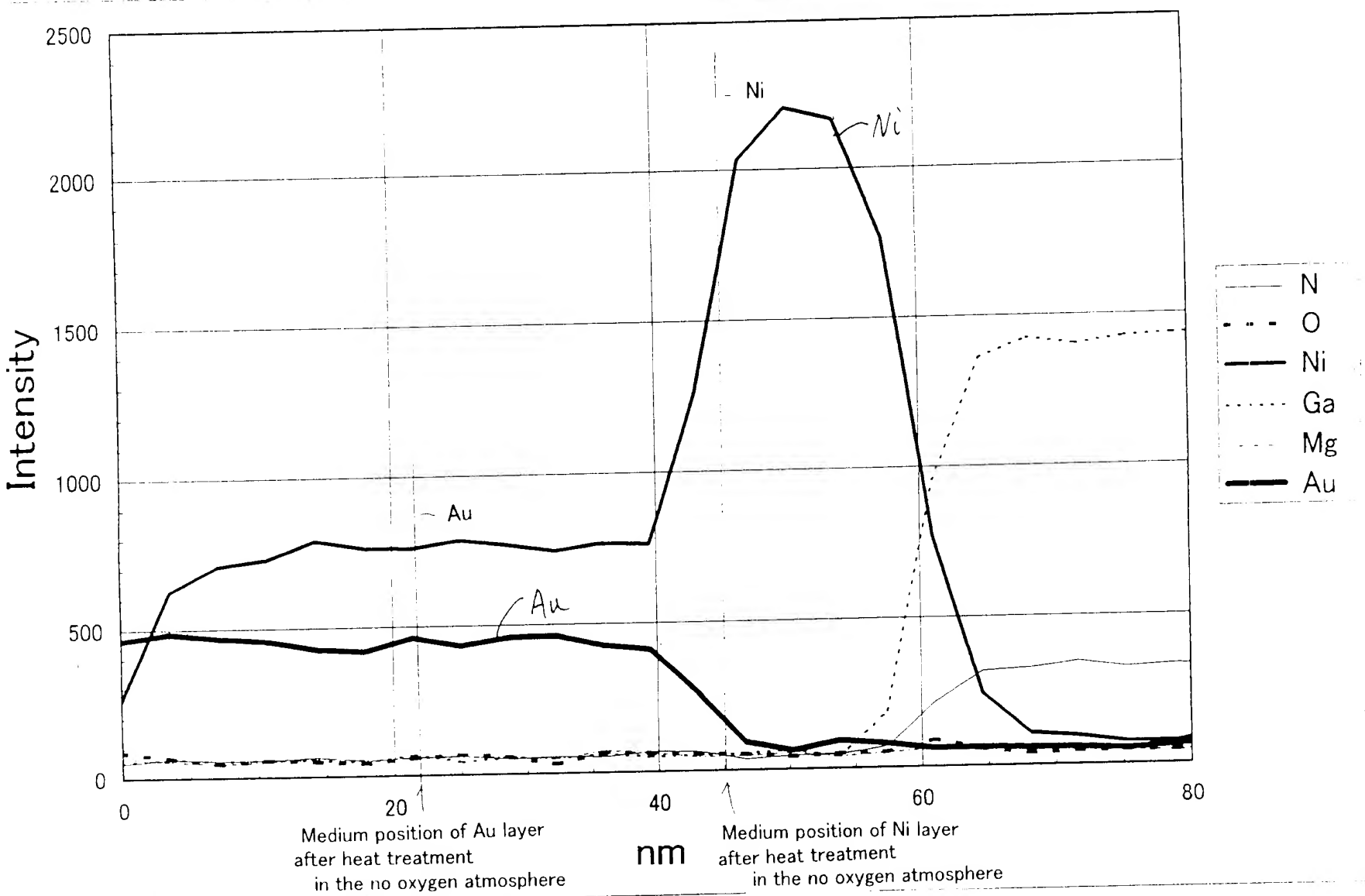
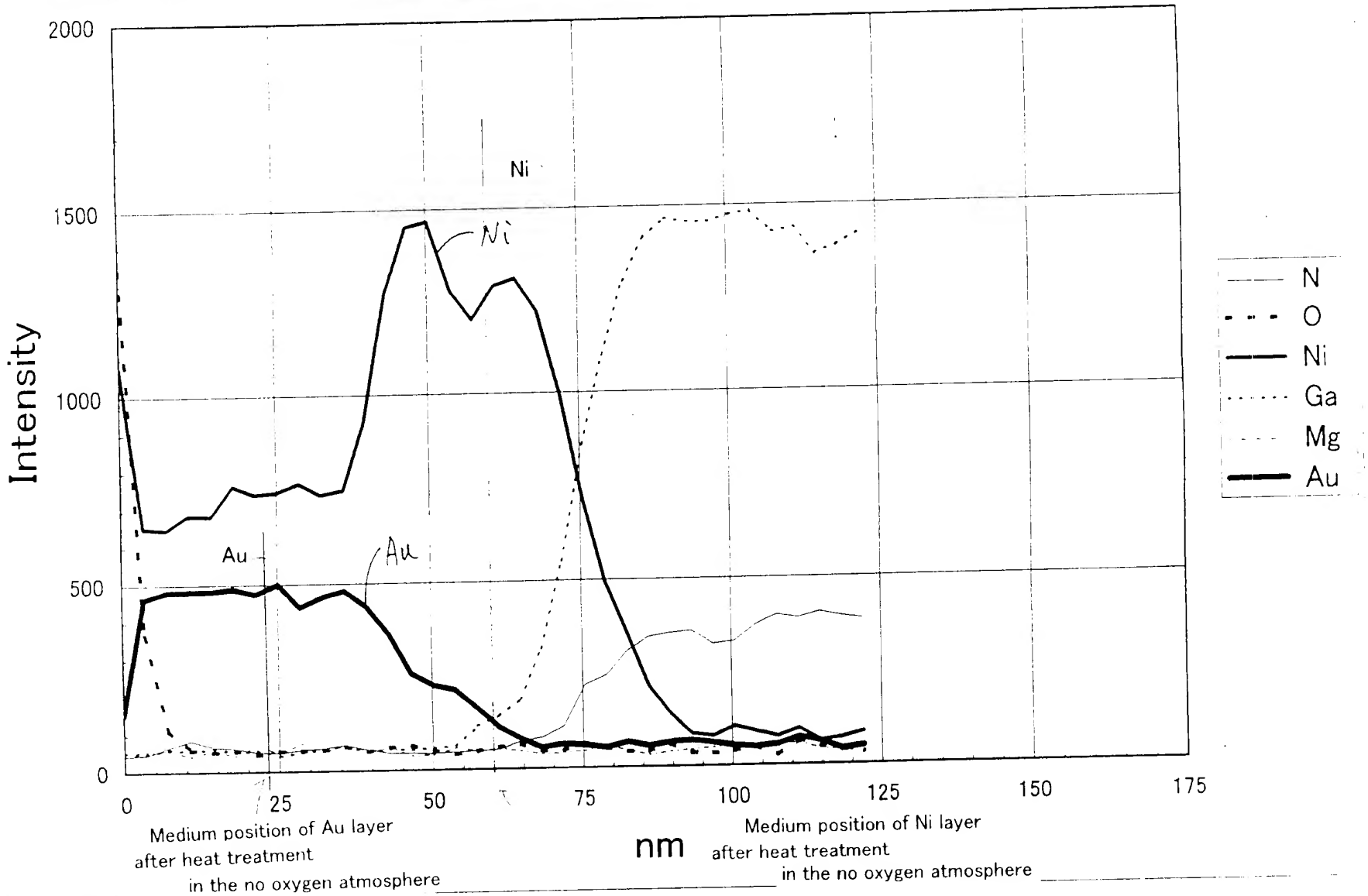

2500
2000
1500
1000
500
0
Intensity
Ni
Ni
Au
Au
0
20
40
60
80
nm
Medium position of Au layer
after heat treatment
in the no oxygen atmosphere
Medium position of Ni layer
after heat treatment
in the no oxygen atmosphere
N
O
Ni
Ga
Mg
Au

Fig A-5


2000
1500
1000
500
0
Intensity
Ni
Ni
Au
Au
0
25
50
75
100
125
150
175
nm
N
O
Ni
Ga
Mg
Au
Medium position of Au layer
after heat treatment
in the no oxygen atmosphere
Medium position of Ni layer
after heat treatment
in the no oxygen atmosphere